

**Species Listing PROPOSAL Form:**  
**Listing Endangered, Threatened, and Special Concern Species in Massachusetts**

Scientific name: *Pycnanthemum clinopodioides*

Current Listed Status (if any): **Endangered**

Common name: **Basil Mountain-Mint**

**Proposed Action:**

       Add the species, with the status of :                     

**X** Remove the species

       Change the species' status to:                     

Change the scientific name to:                     

Change the common name to:                     

(Please justify proposed name change.)

**Proponent's Name and Address:**

**Melissa Dow Cullina, Botanist**  
**Natural Heritage & Endangered Species Program**  
**Massachusetts Division of Fisheries & Wildlife**  
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Association, Institution or Business represented by proponent: **NHESP**

Proponent's Signature:

Date Submitted: **January 4, 2008**

Please submit to: Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife, 1 Rabbit Hill Road, Westborough, MA 01581

**Justification**

Justify the proposed change in legal status of the species by addressing each of the criteria below, as listed in the Massachusetts Endangered Species Act (MGL c. 131A) and its implementing regulations (321 CMR 10.00), and provide literature citations or other documentation wherever possible. Expand onto additional pages as needed but make sure you address all of the questions below. The burden of proof is on the proponent for a listing, delisting, or status change.

**(1) Taxonomic status.** Is the species a valid taxonomic entity? Please cite scientific literature.

*Pycnanthemum clinopodioides* Torr. & A.Gray ex A.Gray is a validly published name; the taxon was first described in 1842 (Amer. J. Sci. Ser. I. xlii). However, independent cytological, morphological and molecular studies of this taxon strongly suggest that the taxon is an unstable, recently-derived hybrid. In a comprehensive taxonomic study of the morphology genus *Pycnanthemum*, Grant and Epling (1943) concluded that *P. clinopodioides* "is rather variable in habit and suggests strongly a hybrid origin between a member of the *P. incanum* group and one of the narrow-leaved species." In a separate study of the cytology of *Pycnanthemum*, Chambers and Chambers (1971) found that "support for the view that *P. clinopodioides* is not a completely stabilized species may be found in the meiotic irregularities and partial pollen abortion of the West Rock [CT] plants." This study named *P. incanum* as one parent and noted the nearby presence of *P. tenuifolium*. Finally, a molecular study of Massachusetts plants was funded by NHESP in order to clarify the specific status of the taxon (Kesseli and Dole, unpublished), which grows with both *P. tenuifolium* and *P. incanum* at the single current Massachusetts station. Gel electrophoresis (RAPDs) comparing the three taxa

found that “a substantial number of bands from both *P. incanum* and *P. tenuifolium* were also present in *P. clinopodioides* (68% and 35%, respectively). Second, no band present in *P. clinopodioides* was absent from all accessions of the two common taxa. These data strongly suggest that... *P. clinopodioides* has a hybrid origin” and “an analysis of this [RAPDs] data showed that the extant population is recently derived and is most likely the result of a single hybridization followed by at most one generation of selfing.”

To restrict MESA eligibility to newly-evolved taxa of hybrid origin (nothospecies, rather than unstable hybrids), NHESP listing criteria states that “*a plant taxon of hybrid origin may be listed if it has been shown to be both: (1) capable of sexual reproduction; and (2) able to maintain discrete populations separate from the parent taxa*” (NHESP, 2007). Clearly, *P. clinopodioides* meets neither criterion for MESA eligibility, and therefore must be delisted.

(2) **Recentness of records.** How recently has the species been conclusively documented within Massachusetts?

(3) **Native species status.** Is the species indigenous to Massachusetts?

(4) **Habitat in Massachusetts.** Is a population of the species supported by habitat within the state of Massachusetts?

(5) **Federal Endangered Species Act status.** Is the species listed under the federal Endangered Species Act? If so, what is its federal status (Endangered or Threatened)?

(6) **Rarity and geographic distribution.**

(a) Does the species have a small number of occurrences (populations) and/or small size of populations in the state? Are there potentially undocumented occurrences in the state, and if so, is it possible to estimate the potential number of undocumented occurrences?

(b) What is the extent of the species’ entire geographic range, and where within this range are Massachusetts populations (center or edge of range, or peripherally isolated)? Is the species a state or regional endemic?

(7) **Trends.**

(c) Is the species decreasing (or increasing) in state distribution, number of occurrences, and/or population size? What is the reproductive status of populations? Is reproductive capacity naturally low? Has any long-term trend in these factors been documented?

(8) **Threats and vulnerability.**

(d) What factors are driving a decreasing trend, or threatening reproductive status in the state? Please identify and describe any of the following threats, if present: habitat loss or degradation; predators, parasites, or competitors; species-targeted taking of individual organisms or disruption of breeding activity.

(e) Does the species have highly specialized habitat, resource needs, or other ecological requirements? Is dispersal ability poor?

**Conservation goals.**

What specific conservation goals should be met in order to change the conservation status or to remove the species from the state list? Please address goals for any or all of the following:

(a) State distribution, number of occurrences (populations), population levels, and/or reproductive rates

(b) Amount of protected habitat and/or number of protected occurrences

(c) Management of protected habitat and/or occurrences

**Literature cited, additional documentation, and comment**

Chambers, H.L. and K.L. Chambers. 1971. Artificial and natural hybrids of in *Pycnanthemum* (Labitae). *Brittonia* 23: 71-88.

Grant, E. and C. Epling. 1943. A study of *Pycnanthemum* (Labitae). *University of California Publications in Botany*. 20: 195-240.

Kesseli, R. and J. Dole. Unpublished. The status of *Pycnanthemum clinopodioides* in Massachusetts. 1998 Report to the Natural Heritage & Endangered Species Program, Division of Fisheries & Wildlife, Westborough, Massachusetts.

NHESP, 2007. *Listing Endangered Species in Massachusetts: The Basis, Criteria, and Procedure for Listing Endangered, Threatened, and Special Concern Species in Massachusetts*. November 28, 2007 version. Massachusetts Natural Heritage & Endangered Species Program.

